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THE
QUARTERLY JOURNAL
OF
ECONOMICS

AUGUST, 1922

LAND VALUES IN NEW YORK CITY ¹

SUMMARY

Introductory. Method of study, 545. — I. Vacant land in the borough of Manhattan. Description of parcels. Gross and net increments and decrements, 548. — II. Washington Heights. Tract sold at auction in 1891. Gross and net increments. Early history of tract. Comparison with similar tract in the Bronx, 558. — III. Auction sales. Description of tracts. Losses to purchasers of Bronx lots, 562. — IV. New York City by boroughs. Method of establishing value in 1906 and 1921. Gross and net increments or decrements. Queens borough by wards. Separate tract in South Brooklyn. Increases in land values during nineteenth century. The tax rate and economic rent, 569. — Conclusions, 579.

In all the literature of land values and of economic rent there is surprisingly little in the way of concrete statistical data. Where reforms in land tenure and taxation have been advocated such figures as have been presented have often been loosely used without any thoroughgoing analysis of their significance. Even the fundamental economic theories in regard to land and rent have never been adequately checked by modern statistical methods. This situation is due largely to the great difficulty in obtaining satisfactory statistical ma-

1. This study was prepared under the direction and with the advice of a committee consisting of Alexander M. Bing, Richard S. Childs, Clarence Stein, Robert D. Kohn, Lawson Purdy, Frederick L. Ackerman, Robert Murray Haig, Graham R. Taylor, Robert E. Simon, Herbert S. Swann, and C. H. Whitaker.

terial. Assessors' valuations, until very recently at least, have been entirely untrustworthy, and when in the sale of land the consideration is stated, it is difficult to determine the value of the land as distinguished from the value of buildings and other improvements.

It was with the desire of supplying some trustworthy data on which reliable conclusions could be based that an investigation was begun which resulted in this study. The figures presented were compiled from the original records and published reports of the New York Tax Department or from other original and trustworthy sources. It is obviously impossible, within a limited time, to make such a study at all exhaustive, and many similar investigations in New York, as well as in other cities, will be necessary before a sufficient body of statistical material is accumulated for an adequate consideration of all the disputed questions in regard to land values, rent and land taxation. It will appear, however, from the figures here presented that some facts and general conclusions are indicated even by so brief a study as this.

The investigation was started without any very definite plan and without complete knowledge as to the extent or availability of the material. This paper is, therefore, simply a record and brief analysis of the facts which came to light in the course of the work. These facts fall naturally into four general divisions: first, the results of an intensive study of nine vacant or nearly vacant parcels of land in the developed sections of the borough of Manhattan; second, an intensive study of a tract of about fourteen blocks on Washington Heights together with a large acreage tract in the upper Bronx; third, a study of ten tracts which were subdivided and sold at auction between the years 1905 and 1913; fourth, a less detailed study of each of the five boroughs

of New York City from 1906 to 1921, with additional data in regard to the five wards in the borough of Queens, and a tract of 24 square miles in Brooklyn.

The tracts and parcels to be studied were chosen on account of the availability of data pertaining to their value without regard to the probable balance of gain or loss to the owners. Each tract was traced back as far as possible consistent with a fair degree of accuracy to some year in which a reasonably accurate estimate of value could be made. From that year the assessed valuations were traced through the year 1921 and the taxes computed for each year. The amounts paid in special assessments were obtained by searching the original records in the Bureau of Assessments and Arrears of the New York City Tax Department. Interest compounded annually at 4 per cent was computed on the base value through the year 1921 and also on all items of taxes and assessments from the date they became due through 1921. Whenever any part of a tract or parcel was improved by building, it was assumed that the income from the improvement would cover the taxes and interest items on the parcel improved. Taxes and interest, therefore, were computed only on the value of the vacant portions of the tract. Special assessments, however, were included regardless of improvement, since these may be considered in the nature of capital charges, a payment to the city for additional value directly added to the property. The question of the actual net return to the owner on improved properties was not considered of importance in connection with this study, since the erection and management of buildings is a business in itself in which the rate of net profit bears no necessary relationship to the value of the land used. It may be noted, however, that in the opinion of business men, real estate investments, averag-

ing the good with the bad, yield no more than a moderate return. Four per cent was used as the rate of interest on the assumption that this rate could have been obtained at any time by conservative investments or savings bank deposits. Since the propriety of including any interest charges at all as a part of the carrying charges may be questioned, these items are always separated from the other charges in the tables and in the text. Whether or not interest should be considered in connection with the social aspects of the problem, it must be considered in an estimate of the profit or loss of the land speculator.

In the following pages the four main divisions of the study as outlined above will be considered in separate sections.

I

VACANT LAND IN THE BOROUGH OF MANHATTAN

While each of the nine parcels covered in this section shared in the general increase in land values due to the growth of the city and the nation in population and wealth, the rate of increase in different sections has varied widely. It is, therefore, necessary first to consider briefly the location and history of these parcels in order to understand the local conditions which have influenced their development.

1. Fourteenth Street. The first of these parcels to assume its present form is located on Fourteenth Street, beginning 200 feet west of Fifth Avenue. It consists of fifteen city lots with a total frontage of 225 feet on Fourteenth Street and 150 feet on Fifteenth Street. The only improvements are a four-story stone residence and a brick stable. These buildings were erected in 1853 and replaced two

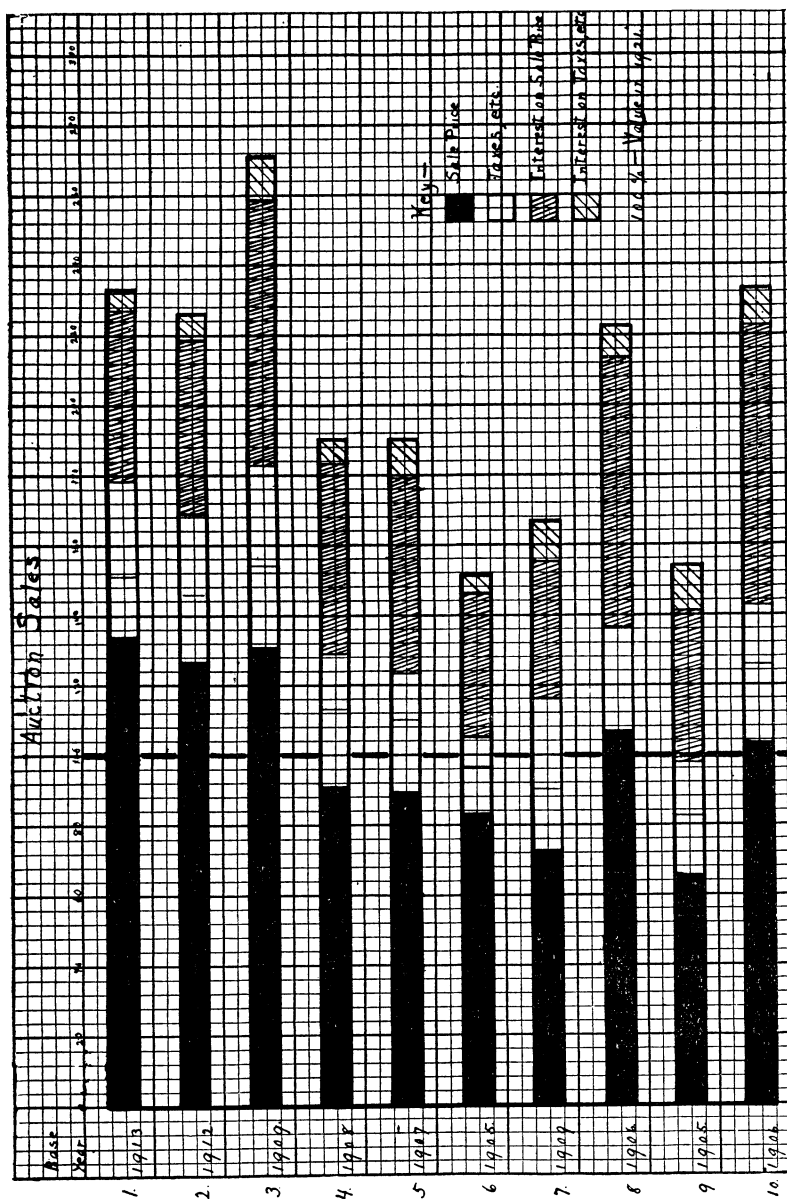


VACANT LAND — MANHATTAN, 1880-1921

older houses which appeared on the tax records from 1840 to 1853. This tract was a part of a large estate and there is no record of its transfer except by inheritance since 1788. It appears as a separate tract on the tax records in 1840 in which year the land alone was valued for taxation at \$28,500. Since vacant land at that time was assessed at less than 50 per cent of its true value, we have taken \$60,000 as a conservative estimate of the land value in that year. It has been assumed that the use value of the residence and stable has been sufficient to cover the carrying charges on three of the fifteen lots during the whole period of eighty-one years. The use value was undoubtedly greater than this during the years when the mansion was new and when the vacant part of the tract was used as a spacious lawn and garden, but at that time the carrying charges on the land were only from \$5,000 to \$9,000 a year. Since the house has long been obsolete its present value can be but a small fraction of the 1921 carrying charge of \$130,000.

2. Fifth Avenue above 39th Street. This parcel has been held vacant by the Wendel estate since 1845 when it was purchased with adjoining land for \$8,000. On the basis of this sale this frontage of 54 feet on Fifth Avenue was valued at about \$3,000. The development of Fifth Avenue first as a residence and then as a business center has given to this parcel the most rapid and consistent increase in value of any of the parcels studied.
3. Fifth Avenue and 73d Street. This corner lot with an avenue frontage of 77.2 feet and a depth of 130 feet was sold in 1866, with dimensions as at present, for \$82,500. It has never been improved.

4. Fifth Avenue above 75th Street. This is an interior lot with a frontage of 67.2 feet. A tract including this lot was purchased in 1860 for \$48,000. By a comparison of assessed valuations of the lots in this tract it appears that the sale value of this lot alone in 1860 was about \$20,000.
5. Fifth Avenue, 95th to 96th Streets. This entire block frontage is still vacant, altho never held under one ownership. By a comparison of a number of sales in this tract from 1853 to 1859 with the corresponding assessed valuations, the probable value of this tract is fixed at \$11,400 in 1856.
6. Fifth Avenue, 97th to 98th Streets. By a comparison of sales and valuations the value of this block frontage in 1865 is estimated at \$65,000.
7. West 64th Street near Broadway. This parcel has a frontage of 100 feet on 64th Street near its intersection with Broadway and Columbus Avenue, and also a diagonal frontage of 29 feet on Broadway. On the basis of several sales, including parts of the lot under consideration, the value of the whole lot in 1854 is estimated at \$3,000. It has never been adequately improved, altho at present it is being used as a gasoline filling station with a driveway through from Broadway to 64th Street.
8. Central Park West and 97th Street. This corner plot with a frontage of 100 feet on Central Park West and 200 feet on 97th Street was sold with other land in 1859. On the basis of this sale and a sale of an adjoining lot the value in that year is estimated at \$15,000. In 1918 it was fully improved with apartment houses so all computation of carrying charges ends with 1917.
9. Riverside Drive, 109th Street to Cathedral Parkway. This large lot was originally part of a larger



tract extending from old Bloomingdale Road to the Hudson River. A part of the tract was taken by the city for Riverside Drive in 1873 and in 1880 a small strip on the east was added by the closing of Bloomingdale Road. The value in 1880 is estimated at \$60,000 from a comparison of the assessed valuation and sales in that year. The owners have received an income of perhaps \$3,000 a year for the past few years from the rental of bill board space. A large apartment house is now under construction on this lot.

The following tables give the most important results of the study of these nine cases. Table I gives the total figures in each item of the carrying charges on each of the nine parcels from the original base year together with the totals of these items and the estimated value in 1921. This estimate is based upon an assumed ratio of 95 between the assessed valuation and the true value. The New York City Tax Department has endeavored to assess property at its full value since 1911, but the evidence of actual conveyance indicates a slight underassessment in 1921.²

On the original computation each of these parcels was traced back as far as it could be separately identified on the tax records, and as far as the different items of carrying charge could be determined with a fair degree of accuracy. This method resulted in nine different base years, ranging from 1840 to 1880, with base-year values ranging from .3 per cent to 15.0 per cent of the value in 1921. In order to make the results of the separate computations comparable one with another, the value of each parcel was estimated for 1880

2. A sample of 162 widely distributed sales in 1921, excluding foreclosures, shows a median ratio of assessed valuation to sale price of 94. Nearly all were sales of partly improved land, as it was impossible to find enough sales of vacant land in Manhattan to establish a trustworthy median.

TABLE I. — VACANT LAND, MANHATTAN

No.	Location and base year	Value in base year	Taxes	Special as- sessments	Interest on base value comp. at 4 %	Interest on taxes comp. at 4 %	Interest on special as- sessments comp. at 4 %	Total cost	Value in 1921
1	14th St., 1840 est.	\$60,000	\$385,981	\$5,072	\$1,102,209	\$749,234	\$32,614	\$2,336,010	\$726,000
2	Fifth Ave. and 39th, 1845 sale	3,000	311,781	1,031	56,109	290,552	8,487	670,960	932,000
3	Fifth Ave. and 73d, 1866 sale	82,500	320,741	3,337	631,189	335,523	18,568	1,391,858	726,000
4	Fifth Ave. and 75th, 1866 sale	20,000	203,083	1,064	198,720	214,630	10,784	649,481	438,000
5	Fifth Ave. and 95th, 1866 sale	11,400	301,147	10,355	134,617	320,994	47,161	825,674	737,000
6	Fifth Ave. and 97th, 1865 sale	65,000	184,546	11,781	519,185	219,466	52,089	1,052,067	474,000
7	64th St. and Broadway, 1854 sale	3,000	100,771	7,541	38,565	91,499	43,374	289,750	388,000
8	Central Pk. W. and 97th, 1859 sale	15,000	78,329	7,187	130,892	91,437	24,202	337,047	195,000
9	Riverside Drive and 109th, 1880 est.	60,000	156,509	21,689	241,231	106,757	46,884	633,070	421,000
	Total	\$319,900	\$2,043,388	\$69,657	\$3,052,717	\$2,420,092	\$290,163	\$8,195,917	\$5,057,000

TABLE II. — VACANT LAND, MANHATTAN, 1880-1921

No.	Location	Value in 1880	Taxes	Special as- sessments	Interest on base value comp. at 4 %	Interest on taxes comp. at 4 %	Interest on special as- sessments comp. at 4 %	Total cost	Value in 1921
1	14th St.	\$320,000	\$323,050	\$1,022,303	\$299,799	\$1,965,152	\$726,000
2	Fifth Ave. and 39th.	75,000	294,694	487	299,478	179,376	701	849,736	932,000
3	Fifth Ave. and 73d.	150,000	301,492	479	599,351	232,966	1,156	1,285,444	726,000
4	Fifth Ave. and 75th.	90,000	190,974	353	359,284	144,750	514	1,252,875	458,000
5	Fifth Ave. and 95th.	150,000	281,252	4,463	599,351	206,817	10,730	1,252,613	737,000
6	Fifth Ave. and 97th.	90,000	168,322	3,334	359,284	129,670	8,522	759,132	474,000
7	64th St. and Broadway.	35,000	95,001	1,106	139,733	55,086	2,944	328,870	388,000
8	Central Pk. W. and 97th.	42,500	70,413	2,440	138,697	51,927	4,678	310,855	195,000
9	Riverside Drive and 109th.	60,000	156,509	21,689	241,231	106,757	46,884	633,070	421,000
	Total	1,012,500	1,881,707	34,351	3,758,912	1,407,148	76,129	8,170,747	5,057,000
	Total 2-9	\$692,500	\$1,558,657	\$34,351	\$2,736,609	\$1,107,349	\$76,129	\$6,205,595	\$4,331,000

and the various items of carrying charge recomputed as from that date (Table II). The assessed valuations in 1880 were found to be about 50 per cent of sale values,³ and this ratio was used in the estimates, corrections being made wherever specific sales of the property, or property in the immediate vicinity, indicated a different local ratio. The year 1880 was selected as the common base year, not only because it was the earliest year common to all the original computations, but because 1880 is generally considered to have been a normal business year. Land values had recovered from the depression following the crisis of 1873 and the general level of commodity prices was again normal.⁴

A comparison between the percentage tables III and IV shows that when all the items are taken into

TABLE III. — VACANT LAND, MANHATTAN
Costs as percentages of value in 1921

Base year	Value in base year	Taxes	Special assessments	Interest on base value	Interest on taxes	Interest on special assessments	Total cost	Value in 1921
1. 1840	8.3	53.2	.7	171.7	103.2	4.6	321.7	100.0
2. 1845	.3	33.5	.1	6.0	31.2	.9	72.0	100.0
3. 1866	11.3	44.2	.5	86.9	46.2	2.6	191.7	100.0
4. 1860	4.4	44.5	.4	43.4	46.8	2.3	141.8	100.0
5. 1856	1.5	40.9	1.4	18.3	43.5	6.4	112.0	100.0
6. 1865	13.7	38.9	2.5	109.5	46.3	11.0	221.9	100.0
7. 1854	.8	26.0	1.9	9.9	23.6	12.5	74.7	100.0
8. 1859	7.7	40.2	3.7	67.1	46.9	12.4	178.0	100.0
9. 1880	14.2	37.2	5.2	57.3	25.4	11.1	150.4	100.0
Total	6.3	40.4	1.4	60.4	47.9	5.7	162.1	100.0

3. An analysis of 213 sales of land in 1880 for which considerations were stated shows a median ratio of exactly 50. Of these sales 129 were of vacant land showing a median ratio of 43.5. The 84 improved parcels showed a median ratio of 67.

4. For the whole of Manhattan Island the real estate valuation in 1880 was \$919,669,205. Assuming a 50 per cent valuation and assuming that the value of the land was slightly in excess of the value of improvements we arrive at an estimated land value in 1880 of \$1,000,000,000. The estimated land value in 1921 was \$3,468,000,000, of which the value in 1880 was 28.8 per cent. Taking the value in 1880 as a base, land values in Manhattan as a whole have risen 250 per cent while the values of the nine parcels considered have increased 400 per cent. It is evident, therefore, that the parcels selected have increased in value much more rapidly than has the average parcel of land in Manhattan.

TABLE IV. — VACANT LAND, MANHATTAN. 1880-1921
Costs as percentages of value in 1921

No.	Value in base year 1880	Taxes	Special assess- ments	Interest on base value	Interest on taxes	Interest on special assess- ments	Total cost	Value in 1921
1	44.1	44.5	...	140.8	41.3	...	270.7	100.0
2	8.1	31.6	...	32.1	19.3	.1	91.2	100.0
3	20.7	41.5	.1	82.5	32.1	.2	177.1	100.0
4	19.7	41.7	.1	78.4	31.6	.1	171.6	100.0
5	20.4	38.1	.6	81.3	28.1	1.5	170.0	100.0
6	19.0	35.5	.7	75.8	27.4	1.8	160.2	100.0
7	9.0	24.5	.3	36.0	14.2	.8	84.8	100.0
8	21.8	36.1	1.3	71.2	26.6	2.4	159.4	100.0
9	14.2	37.2	5.2	57.3	25.4	11.1	150.4	100.0
Total	20.0	37.2	.7	74.3	27.8	1.5	161.5	100.0
Total, 2-9....	16.0	36.0	.8	63.2	25.5	1.8	143.3	100.0

consideration the change in the base year made comparatively little difference. In Table IV the average base-year value is 20.0 per cent as compared with 6.3 per cent in Table III, but owing to the shorter period of computation the items of taxes and assessments with interest are enough lower so that the average of the total cost column in one table is 162.1 per cent and in the other 161.5 per cent of the total land value in 1921. It will be noted that the figures in the tax column are only slightly lower in Table IV than in Table III. This is not only due to the low assessed valuations before 1880 but to the low tax rate. From 1840 to 1861 the median tax rate was 1.02 on an assessed valuation about 50 per cent of the sale value. This is equivalent to a tax rate on a true valuation of .5 per cent. From 1861 to 1880 the median rate was about 0.90. From 1880 to 1910 the median rate was 1.12 and from 1911 to 1921 it was 2.02 with a rate of 2.77 in 1921. Special assessments have increased even more rapidly than taxes. The early assessments for public improvements were so light that in these parcels, located in the older parts of the city, the assessments amount to a

comparatively small item of carrying charge. It is also true that many of the heaviest assessments which were levied on these properties came at a still earlier date than that at which the computation begins. Taking simply the base value in 1880 without interest and adding the taxes and assessments with interest on these payments to the city, the total cost to the owners has been 87.2 per cent of the 1921 value, leaving only 12.8 per cent of the present value or 37.7 per cent of the value in 1880 as interest on the base value over a period of forty-one years.

The greatest losses were sustained in the Fourteenth Street section. In Parcel 1, the taxes and interest on taxes on only four-fifths of the property amount to 85.8 per cent of the present value of the whole, or 107.0 per cent of the value of the four-fifths alone. If no allowance were made for improvements ⁵ the value in 1880 with the actual taxes paid since that date, without any interest items, would exceed by 4 per cent the value in 1921. While this property is now worth only a little more than double its value in 1880 the parcel on Fifth Avenue above 39th Street is now valued at eleven times the estimate for 1880. But even here the owner has paid one-third of its present value in taxes and allowing 4 per cent interest on the value in 1880 the total cost in 1921 is 91.2 per cent. The parcel on West 64th Street has increased to more than ten times its value in 1880, and even in the past eight years it has increased over 50 per cent. Here the taxes have been only 24.5 per cent and the total cost 84.8 per cent of the present value. From the owner's point of view this is the most favorable showing of any of the nine parcels, but it is equivalent only to an investment yielding about 5 per cent interest.

5. In 1904 the buildings were valued at \$20,000 in a total valuation of \$950,000. In 1920 the buildings were valued at \$2,000.

The parcels on upper Fifth Avenue and Central Park West have increased to about five times their value in 1880 but the taxes alone have been double the base value and, including the interest items, the total cost of the five parcels ranges from 160.2 to 177.1 per cent of their value in 1921.

All but one of these parcels have increased in value more rapidly than has Manhattan Island as a whole. Only two parcels, and these in the two most rapidly growing business sections of the city, have yielded to the owner an interest return of more than 4 per cent. If, however, these parcels had been kept improved with buildings which would rent for enough to pay all carrying charges, including amortization, and then sold at the 1921 valuation there would have been an "un-earned increment" of \$4,045,000 over a base value of \$1,012,500, in addition to a normal return of the investment, equivalent to 4 per cent interest compounded annually on the base value for forty-one years.

II

WASHINGTON HEIGHTS

In the extreme northern part of Manhattan Island the period of rapid development has been comparatively recent and it was found possible to trace a relatively large tract through its whole course of development from agricultural land to valuable city property. The tract selected was originally a farm of about 38 acres, now covered by about fourteen city blocks, on Washington Heights. The tract studied is located between Broadway and Amsterdam Avenue and runs from 178th to 182d Streets. It includes a particularly valuable corner at 181st Street and St. Nicholas Avenue with a subway station and local shopping district, and has

a direct connection with the Bronx across Washington Bridge. In 1891 this tract was subdivided into 411 lots and sold at public auction. The year 1891 was therefore taken as the base year for the subsequent computations and the value in the base year was considered equal to the total proceeds of the sale. The first houses were built in the following year and by 1898 41 lots, or 10 per cent, were improved by buildings. The opening of the subway gave a great impetus to development and by 1909 the tract was 51 per cent improved. In 1921 only 38 out of the 411 lots remained vacant. The increase in the value of the land has been unusually rapid. In 1906, the first year in which the Tax Department published separate valuations for land and buildings by sections, the land in this tract was valued for taxation at \$3,144,300. In 1921 the same land was valued at \$8,996,100, an increase of 186 per cent.⁶ During the same period the valuation of all land in the Tax Department Section 8, which includes Washington Heights, has increased about 100 per cent, and all land in the borough of Manhattan about 25 per cent.⁷

In the following tables, carrying charges have been computed on the tract as a whole and also separately on the 38 lots which still remained vacant at the beginning of 1921 and on the 41 lots which were first improved.

For the whole tract the owners paid to the city \$1,134,500 in special assessments and in taxes on vacant land. Including interest chargeable to vacant land the total was \$1,633,891 or 18.1 per cent of the 1921 value. On the portion remaining vacant to 1921

6. Sales in the Washington Heights section in 1921 indicated 100 per cent valuation.

7. An examination of 303 sales in 1906 shows a median ratio of valuation to sale price of 76. There has been very little actual increase in general land values in Manhattan Island since 1906. See Section IV.

TABLE V. — TRACT ON WASHINGTON HEIGHTS, 178TH TO 182D STREETS

	Base year	Sale value	Taxes on vacant land	Special as- sessments	Interest on sale value comp. at 4%	Interest on taxes comp. at 4%	Interest on special as- sessments comp. at 4%	Total cost	Value in 1921
Entire tract	1891	\$1,490,420	\$653,475	\$481,025	\$1,642,380	\$234,651	\$264,740	\$4,766,691	\$8,996,100 ¹
First improved tenth	1891	124,422	4,352	40,672	22,203	508	534	192,691	729,500
Unimproved tenth	1891	131,450	165,248	46,495	294,892	76,412	59,370	773,867	474,500
Entire tract	1891	16.6	7.3	5.4	18.2	2.6	2.9	53.0	100.0
First improved tenth	1891	17.0	.6	5.6	3.0	.1	.1	26.4	100.0
Unimproved tenth	1891	27.7	34.8	9.8	62.2	16.1	12.5	163.0	100.0

¹ Assessed valuation. Sales in 1921 indicate 100% assessment.

TABLE VI. — TRACT 1. WASHINGTON HEIGHTS, BEFORE 1891. TRACT 2. NORTH BRONX, 1894-1921

Tract	Period of computation	Value in base year	Taxes	Special assessments	Interest on base value comp. at 4%	Interest on taxes comp. at 4%	Interest on special assessments comp. at 4%	Total cost	Value final year
1	1850-1891	\$24,000	\$104,080	\$77,409	\$95,733	\$75,474	\$67,313	\$444,009	\$980,000
1	1868-1891	330,174	90,769	76,678	433,612	48,128	64,140	1,093,501	980,000
2	1894-1921	312,722	204,599	74,900	589,027	93,738	14,840	1,289,826	514,100
1	1850-1891	2.4	10.6	7.9	9.8	7.7	6.9	45.3	100.0
1	1868-1891	33.7	9.3	7.8	49.4	4.9	6.5	111.6	100.0
2	1894-1921	60.8	39.8	14.6	114.6	18.2	2.9	280.9	100.0

the corresponding charges were \$211,943 for taxes and assessments, or with interest \$347,525, or 73.2 per cent of the 1921 value. On the portion first improved the same charges were \$45,024, or with interest \$46,066, or 6.3 per cent of the 1921 value. In these three computations interest charges on the base value differ even more widely because of the allowances for improvements. On the tract as a whole and on the first improved tenth the owners have enjoyed a material net increment of land value over the total cost including interest, but on the unimproved tenth the total carrying charges more than offset the increase in value, which increase, however, was not relatively as great as in the tract as a whole.

For a number of years prior to the auction of 1891 the tract as acreage had an interesting history. (See Table VI.) It was first sold as city property in 1868 when it was purchased by General Daniel Butterfield and Richard Schell for \$330,174. In 1879 it was sold in foreclosure proceedings for \$225,000. It was sold again in 1880 for \$315,000, in 1883 for \$450,000, in 1885 for \$350,000, and in 1891 for \$980,000. In 1850 it was valued for taxation at \$8,000 which was probably no more than one-third of its true value.⁸ From a base value of \$24,000 in 1850 the total cost including interest to 1885 was \$316,364, as compared with the value as measured by the sale in that year of \$350,000. It is evident, therefore, that practically the whole net increment in forty-one years was taken by those who held the property from 1885 to 1891. General Butterfield and his partner from 1868 to 1879 lost their whole equity of \$50,000 and in addition paid taxes amounting to \$34,234 and special assessments of \$62,817. In

8. Vacant land in the upper part of Manhattan was assessed very low at this time. Seventeen sales of land in the old 12th Ward above 86th Street between 1850 and 1854 show a median ratio of valuation to sale price of 30.

addition the property was encumbered with mortgages amounting to \$280,000 on which interest was paid for several years.

Basing the computation on the purchase price in 1868—\$330,174—the total carrying charges to 1891 including interest amount to \$1,093,501 or 111.6 per cent of the selling price in April of that year and 72.5 per cent of the gross proceeds of the auction sale which took place in the following month.

The tract of about 90 acres in the Bronx was in 1894 in a similar position to that of the Washington Heights tract in 1868. Both were vacant acreage tracts and sold for approximately the same price. In the older tract the computation of Table VI covers twenty-three years and in the newer tract, twenty-seven years. In Tract 1, the value increased to \$980,000 while in Tract 2 over a longer period the value increased only to \$514,100. The total cost including interest items in Tract 1 was only 111.6 per cent of the selling price while in Tract 2 the total cost was 250.9 per cent of the value in 1921. The most striking difference is in the item of taxes. In Tract 2 on a lower actual value, the taxes were more than twice as heavy as in Tract 1. Very few special assessments have as yet been levied on Tract 2.⁹

III

AUCTION SALES

After a tract such as the property described above has passed through a period of speculation as acreage, it is usually subdivided into building lots, which are

9. In the Washington Heights tract in which all the street improvements were completed by 1911 the total cost was about \$13,500 an acre. With the increased cost of labor and materials the anticipated future expense of street improvements on the 90-acre Bronx tract probably tends to discourage speculation and to prevent values from increasing.

TABLE VII. — AUCTION SALES

No.		Base year	Sale price	Taxes on vacant land	Special assessments	Interest on sale price ¹	Interest on taxes ¹	Interest on special assessments ¹	Total cost	Value in 1921
1	Morris Park	1913	\$3,674,590	\$489,448	\$728,793	\$1,335,158	\$67,782	\$79,359	\$6,375,130	\$2,741,900
2	Van Cortlandt	1912	1,384,175	205,033	246,504	349,986	33,461	41,680	2,460,839	1,091,650
3	Riverdale	1909	260,075	49,531	57,508	151,798	11,249	13,094	543,275	200,975
4	Throg's Neck	1908	366,549	88,862	61,439	221,256	20,910	3,419	762,435	401,900
5	Ogden estate	1907	1,520,825	357,943	223,263	952,558	97,962	83,902	3,236,453	1,706,300
6	Beck estate	1905	1,229,400	195,170	122,832	604,929	47,082	31,242	2,230,655	1,474,100
7	Martense farm	1909	146,200	35,551	51,804	79,228	7,615	14,299	334,697	201,300
8	Canarsie	1906	131,600	36,094	...	95,404	11,197	...	274,295	123,300
9	Bay Ridge	1905	181,195	54,907	...	118,380	13,549	22,351	424,994	277,000
10	Livingston	1906	105,700	23,441	16,567	82,355	6,494	3,439	237,996	102,500
	Total		\$9,000,309	\$1,536,000	\$1,543,322	\$4,191,052	\$317,301	\$292,785	\$16,880,769	\$8,320,825

¹ Interest at 4% compounded annually, computed only in proportion to value of land remaining unimproved at the end of each year.

TABLE VIII. — AUCTION SALES. BASE YEAR, 1913

No.		Value in 1913	Taxes on vacant land	Special assessments	Interest on estimated value ¹	Interest on taxes ¹	Interest on special assessments ¹	Total cost	Value in 1921
1	Morris Park	\$3,674,590 ²	\$489,448	\$728,793	\$1,335,158	\$67,782	\$79,359	\$6,375,130	\$2,741,900
2	Van Cortlandt	1,103,000	185,206	246,504	398,925	26,540	41,680	1,999,855	1,091,650
3	Riverdale	219,475	36,539	59,601	76,497	5,628	11,393	408,433	200,975
4	Throg's Neck	353,200	64,592	61,439	116,720	9,154	3,419	608,524	401,900
5	Ogden estate	1,461,940	227,070	127,028	432,260	32,036	31,408	2,331,742	1,706,300
6	Beck estate	1,343,450	85,278	19,670	167,890	12,157	1,543	1,629,988	1,474,100
7	Martense farm	143,250	27,298	39,172	46,393	3,982	9,518	269,613	201,300
8	Canarsie	136,275	20,186	...	44,862	2,915	...	204,238	123,300
9	Bay Ridge	265,750	31,048	485	63,695	4,201	99	365,278	277,000
10	Livingston	87,500	14,546	14,314	30,114	1,924	1,925	150,323	102,500
	Total	\$8,788,430	\$1,181,511	\$1,291,006	\$2,770,514	\$166,319	\$180,344	\$14,338,124	\$8,320,825

¹ Interest at 4% compounded annually, computed only in proportion to value of land remaining unimproved at the end of each year.² Sale price.

sold separately to prospective home builders or small speculators, either at private sale or at a public auction.

The ten tracts discussed in this section were sold at auction at different times between 1905 and 1913. They were selected from among the larger well advertised sales of the period without reference to subsequent development. During this period more sales were held in the Bronx than elsewhere, and because of this fact, six out of the ten tracts are located in that borough. No sales were available in Queens, so that the conclusions do not necessarily apply to conditions in that borough. The tracts selected are, however, certainly typical of the Bronx and probably of Brooklyn and Richmond.

1. The first of these tracts is the property between the New Haven Railroad and Bronx and Pelham Parkway known as Morris Park. The eastern part of it was formerly a race track, and was therefore level and well located for building. The property is cut by the N. Y., Westchester and Boston Electric Railway, and west of the tracks the land is low and not well drained. The whole property of about 230 acres was divided into 3019 lots and sold at auction between May 31 and June 13, 1913. It was described as the largest auction sale of vacant land ever held in New York. The tract was practically vacant in 1913 and only 1.3 per cent improved at the beginning of 1921.
2. In 1912, 700 lots belonging to the Van Cortlandt estate, south of Van Cortlandt Park and east of Broadway were sold at auction. Near Broadway the land is flat and rather low, but to the east the property extends up over a steep hill to the Jerome Park Reservoir. By 1921 4 per cent of the lots were improved.

3. The Samler estate sale was held in 1909. The property consists of 212 lots on the west side of Broadway between 253d and 256th Streets. The lots are nearly all on a steep hillside, but they are easily reached and will be very desirable when opened by street improvements. By 1921, 6 per cent of the lots were improved by buildings.
4. The William Layton estate at Throg's Neck was sold at auction in 1908. The property consisted of 700 lots on and near Eastern Boulevard and extending to Eastchester Bay. At the time it was some distance from any rapid transit line, but it has been made more accessible by the construction of the Westchester Avenue Extension of the subway. The tax valuation for 1921 indicated that 11.6 per cent of the lots were then improved.
5. A tract of 871 lots belonging to the Ogden estate was sold at auction in 1907. The property is directly across Washington Bridge from the Washington Heights tract described in Section II. It extends south from Washington Bridge to High Bridge, and includes much of the steep hillside and some well located lots on the top of the hill. The tract is now 19.6 per cent improved.
6. In 1905, the Beck estate sold at auction 315 lots, more or less scattered east of Boston Road and south of 173d Street. This property was already easily reached by the Third Avenue Elevated, and many lots in the same blocks were already improved. All the streets were open and some of them were paved at the time of sale. More than 200, or 72.8 per cent, of these lots were improved by 1921.
7. The Martense farm in Brooklyn south of Prospect Park was sold at auction in 1909. The property

consisted of 241 lots between Church Avenue and Tehama Street and between 36th and West Streets. The property is now reached by a subway line and is building up rapidly. At the beginning of 1921 it was 29.4 per cent improved.

8. In 1906 a tract of 266 lots in Canarsie was sold at auction. The property extended from East 86th Street to Canarsie Road and from Avenue L to Avenue M. The land is rather low, but not swampy. It is within a few blocks of Jamaica Bay, and is reached by a recent subway extension. It is now 13.4 per cent improved.
9. A part of the original Bennett estate in Bay Ridge, Brooklyn, consisting of 172 lots was sold at auction in 1905. This property is well located between 1st Avenue and Shore Road and between 71st and 73d Streets. It overlooks New York Bay, and is reached by the Bay Ridge Elevated line. By 1921, 36.6 per cent of the lots were improved.
10. A tract of 278 lots belonging to the Hoyt estate at Livingston, Staten Island, was sold at auction in 1906. The property adjoins the land of the Sailor's Snug Harbor. The land is high and the soil sandy. It is reached by the Castleton Avenue surface car line. It is now building up with attractive one-family houses. At the beginning of 1921 it was 8.6 per cent improved.

Table IV shows the carrying charges from the date of sale to 1921 on each of these ten tracts. In Table VIII these same charges are computed from 1913 in order to eliminate the variations due to the different dates of sale. Table IX and Table X show these carrying charges as percentages of the value in 1921.

It will be noted that the greatest losses both absolute and relative in eight years were suffered by the owners

TABLE IX. — AUCTION SALES
Costs as percentages of value in 1921

	Base year	Sale price	Taxes	Special assess- ments	Inter- est on sale price	Inter- est on taxes	Inter- est on special assess- ments	Total cost	Value in 1921
1. Morris Park	1913	134.0	17.8	26.6	48.7	2.5	2.9	232.5	100.0
2. Van Cortlandt	1912	126.8	18.8	22.6	50.3	3.1	3.8	225.4	100.0
3. Riverdale.....	1909	129.5	24.6	28.6	75.5	5.6	6.5	270.3	100.0
4. Throg's Neck	1908	91.3	22.1	15.3	55.0	5.2	.8	189.7	100.0
5. Ogden estate	1907	89.2	21.0	13.1	55.8	5.7	4.9	189.7	100.0
6. Beck estate	1905	83.4	13.2	8.3	41.0	3.2	2.1	151.2	100.0
7. Martense farm	1909	72.6	17.7	25.7	39.4	3.8	7.1	166.3	100.0
8. Canarsie.....	1906	106.7	29.3	—	77.4	9.1	—	222.5	100.0
9. Bay Ridge.....	1905	65.4	19.8	12.5	42.7	4.9	8.1	153.4	100.0
10. Livingston.....	1906	103.1	22.9	16.2	80.3	6.3	3.4	232.2	100.0

TABLE X. — AUCTION SALES, BASE YEAR 1913
Costs as percentages of value in 1921

	Sale price	Taxes	Special assess- ments	Inter- est on sale price	Inter- est on taxes	Inter- est on special assess- ments	Total cost	Value in 1921
1. Morris Park.....	134.8 ¹	17.8	26.6	48.7	2.5	2.9	232.5	100.0
2. Van Cortlandt.....	101.0	17.0	22.6	36.4	2.4	3.8	183.2	100.0
3. Riverdale.....	109.1	18.3	26.7	38.1	2.8	5.7	200.7	100.0
4. Throg's Neck.....	87.9	16.1	15.3	29.0	2.3	.8	151.4	100.0
5. Ogden estate.....	85.7	13.3	7.4	26.5	1.9	1.8	136.6	100.0
6. Beck estate.....	91.1	5.8	1.3	11.4	.8	.1	110.5	100.0
7. Martense farm.....	71.1	13.6	19.5	23.0	2.0	4.7	133.9	100.0
8. Canarsie.....	110.5	16.4	...	36.4	2.4	...	165.7	100.0
9. Bay Ridge.....	95.9	11.2	.2	23.0	1.5	...	131.8	100.0
10. Livingston.....	85.3	14.2	14.0	29.4	1.9	1.9	146.7	100.0
Total.....	105.6	14.2	15.5	32.8	2.0	2.2	172.3	100.0

¹ Sale price.

of the Morris Park tract. A large proportion of the lots in this tract can now be bought for less than the price paid at the auction in 1913. In eight years the owners have paid in taxes and assessments with interest 50 per cent of the value in 1921. The original cost with interest brings the total cost to 230 per cent of the present value. The actual condition of the individual owner was even worse, for 70 per cent of the purchase price was allowed to remain on mortgage, so that on a large part of the total purchase price the rate of interest

was 6 per cent, instead of 4 as calculated. To make the story concrete it may be assumed that a typical purchaser bought two lots at the sale for which he paid \$2,434, giving him a building plot of 50×100 feet. He paid \$730 in cash and assumed a mortgage of \$1,704 at 6 per cent. His annual carrying charge in 1914 was \$188.44 for taxes, assessments and interest. By 1919 his taxes and special assessments alone amounted to \$243. In eight years his tax payments totaled \$326, his special assessments \$486 and his interest including interest on mortgage and savings bank interest on his down payment, \$1,309. At the end of 1921 his lots have cost him \$4,555 and they are now valued at \$1,816. On the improved property in Washington Heights the special assessments alone have totaled over \$1,000 a lot. On this basis without allowing for increased costs the typical owner of two lots in Morris Park still has \$1,500 to pay for necessary improvements,¹ in addition to ordinary taxes which are now \$51 a year on a plot measuring 50×100 feet.

In Tract 3 (the Samler estate), in Tract 8 (Canarsie), and in Tract 10 (Livingston), the percentages of total loss since the date of sale have been even greater than in the Morris Park tract, altho the period of computation is longer. In Tract 6, the Beck estate, where improvement began soon after the sale, and continued until it is now 72.8 per cent improved, the total cost including interest has been 151.0 per cent of the present value. In this tract the special assessments and the taxes on vacant land without interest, amount to 21.5 per cent, while the total increase in value since 1905 is only 16.8 per cent of the value in 1921. This tract shows by far the most favorable results of any of the

1. The land is, however, fairly level, and it is possible that the expense of grading and sewer installation may be less than on Washington Heights.

ten tracts studied. Since 1913 the total increase in value has been slightly more than the taxes and special assessments, without interest.

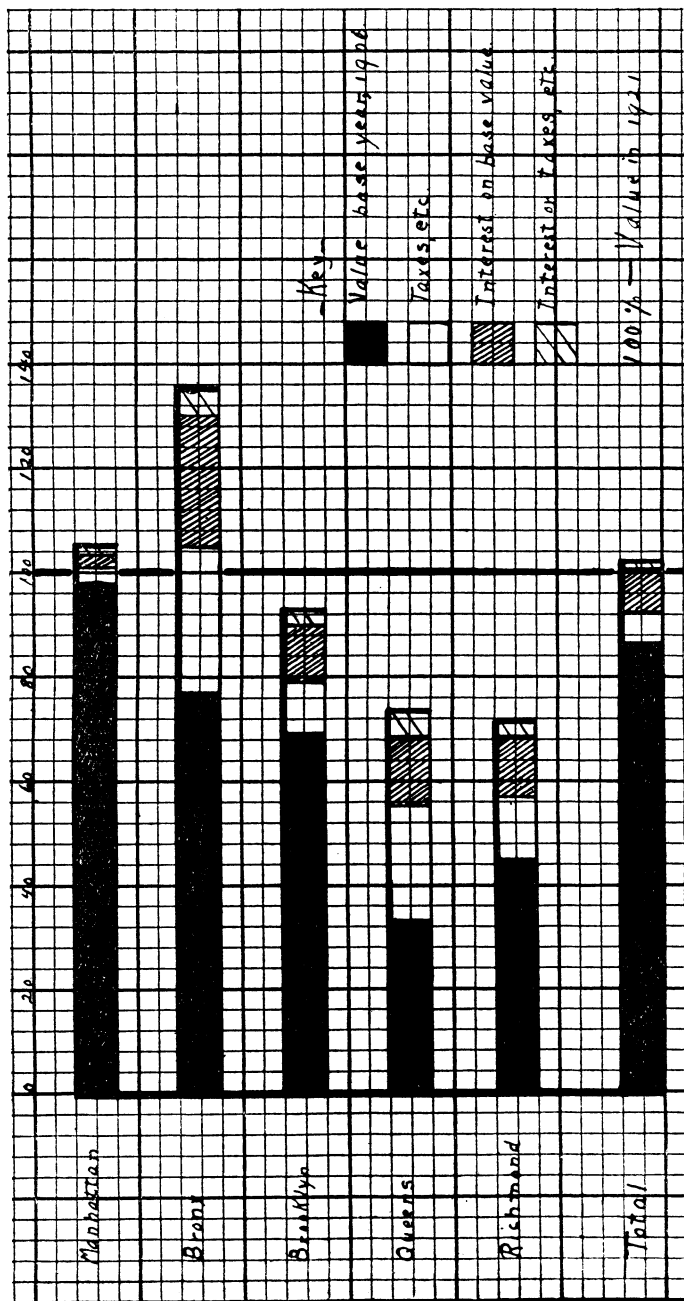
Because of the shorter period which these computations cover the distribution of the various items of cost is quite different from that in the study of the vacant tracts in Manhattan. Based upon the values in 1921 the average value of the Manhattan tracts in 1880 was 21.1 per cent, while the average value of the tracts sold at auction was, in 1913, 106 per cent of the 1921 value, or without the Morris Park tract, 92.3 per cent. In Table X as compared with Table IV, interest on the purchase price, taxes and interest on taxes are all low, but special assessments are much higher.

During the year 1921 there was great activity in the disposal of large tracts by means of auction sales. In the advertising the same phrases were used as in the advertising of the sales between 1905 and 1913, and the same promises were made of great increases in values. It is not within the province of this article to make forecasts, but with taxes in the Bronx at 2.84, prospective special assessments of at least \$1,000 a lot and allowing merely savings bank interest at 4 per cent, it is obvious that the land must increase in value from 10 to 15 per cent a year in order to justify an investment in vacant land which cannot be immediately improved.

IV

NEW YORK CITY BY BOROUGHES

Since 1906 the New York City Tax Department has published reports showing not only the total valuation of real estate but the valuation of land alone by boroughs and sections. Beginning with 1910 the value of vacant land by boroughs is separately stated in the



LAND VALUES IN NEW YORK CITY, 1906-21

reports. By projecting back to 1906 the percentage curve of the value of vacant land by boroughs it is possible to construct tables by boroughs on the same basis as that used for the separate tracts already discussed. In order to arrive at an estimate of the true value of land in 1906 in the borough of Manhattan, 303 actual transfers in that year with consideration stated were compared with the assessed valuations. The median of these 303 ratios was 76, showing that the land was valued for taxation at approximately 76 per cent of its sale value. In Brooklyn a similar test with 100 transfers showed a median ratio of 70 per cent. No test has been made in the other boroughs on account of the difficulty in obtaining satisfactory material. Since 1914 the ratio of assessed valuations to sales has been computed and published by the Tax Department by boroughs. In these years the ratio for Manhattan is nearly always the highest of the five boroughs, the Bronx is second, Brooklyn third, Queens fourth and Richmond the lowest. It has, therefore, been assumed for the purposes of this computation that the ratio in 1906 was 76 for Manhattan, 75 for the Bronx, and 70 for Brooklyn, Queens, and Richmond.

In 1921 a comparison of sale prices with assessed valuations was made for four of the five boroughs. In order to arrive at the land value apart from the value of land and buildings, only transfers of vacant and slightly improved land were used. In Manhattan 190 sales gave a median ratio of assessed valuations to sale prices of 96.5. Excluding foreclosures, the median ratio was 94. In the Bronx 93 sales, excluding foreclosures, gave a median ratio of 100. In Brooklyn the median ratio of 84 sales, excluding foreclosures, was 91 and in Queens 32 sales gave a median ratio of 83. Since the conveyances in Richmond are not published

it was impracticable to make a similar test in that borough. The New York City Tax Department endeavors to assess at full value, so where the number of sales available is small it has been thought proper to make an allowance in the direction of a higher ratio. In the accompanying Tables XI and XII, therefore, the assumed ratio of assessed valuations to sale prices is: Bronx, 100; Manhattan and Brooklyn, 95; Queens and Richmond, 90.

In the borough of Manhattan it appears that land values have increased only 1.4 per cent in fifteen years. Even if we assumed a ratio of 90, the total land value would be only \$3,661,000,000, an increase of \$240,000,000 or 7 per cent in fifteen years. In the same period the special assessments plus the taxes and interest attributable to vacant land amount to \$213,000,000. It is evident, therefore, that there has been no appreciable net increase in land values in fifteen years and if our estimate of the land value of Manhattan is correct there has been a net loss of $4\frac{1}{2}$ per cent. There have been, of course, large increases in certain sections, but these have been offset by losses in other parts of the borough.

In the Bronx the gross increase in value has been 30.9 per cent but the carrying charges have been 76.7 per cent, giving a net loss of 45.8 per cent of the 1906 value or 35.1 per cent of the 1921 value. Allowing again for a wide margin of possible error (10 per cent), the net loss in the Bronx is at least 25 per cent of the present value. The special assessments and taxes on vacant land alone without interest amount to more than the total increase in value since 1906.

In Brooklyn land has shown a very slight net increase while in Queens and Richmond the net increase in value is considerable. In Queens the gross increase

TABLE XI. — LAND VALUES IN NEW YORK CITY. 1906-21
(000 omitted)

Borough	Value in 1906 land only	Taxes paid on vacant land	Special assessments	Interest on 1906 value ¹	Interest on taxes ¹	Interest on special assessments ¹	Total cost	Assessed value of land in 1921	Estimated land value 1921
Manhattan.....	\$3,421,000	\$46,396	\$19,719	\$134,000	\$12,798	\$404	\$3,634,317	\$3,295,000	\$3,468,420
Bronx.....	278,600	41,064	60,281	91,472	11,457	9,620	492,494	366,615	364,615
Brooklyn.....	651,876	44,613	51,798	102,533	12,085	3,773	866,678	892,559	939,526
Queens.....	116,100	40,230	34,316	46,022	11,442	4,354	252,464	309,175	343,528
Richmond.....	29,340	4,494	3,198	7,535	1,186	402	46,455	58,499	64,999
Total.....	\$4,496,916	\$176,797	\$169,312	\$381,862	\$48,968	\$18,553	\$5,292,408	\$4,919,848	\$5,181,098

¹ Interest at 4% compounded annually, computed only in proportion to value of land remaining unimproved at the end of each year.TABLE XII. — LAND VALUES IN NEW YORK CITY. 1906-21
Costs as percentages of value in 1921

Borough	Land value in 1906	Taxes	Special assessments	Interest on value	Interest on taxes	Interest on assessments	Total cost	Land value in 1921
Manhattan.....	98.6	1.3	.6	3.9	.4	..	104.8	100.0
Bronx.....	76.4	11.3	16.6	25.1	3.1	2.6	135.1	100.0
Brooklyn.....	69.4	4.7	5.5	10.9	1.3	.4	92.2	100.0
Queens.....	33.8	11.7	10.0	13.4	3.3	1.3	73.5	100.0
Richmond.....	45.1	6.9	4.9	12.1	1.8	.6	71.4	100.0
Total.....	86.8	3.4	3.3	7.4	.9	.4	102.2	100.0

Costs as percentages of value in 1906

Manhattan.....	100.0	1.3	.6	3.9	.4	..	106.2	101.4
Bronx.....	100.0	14.7	21.6	32.9	4.1	3.4	178.7	130.9
Brooklyn.....	100.0	6.8	8.0	15.7	1.8	.6	132.9	144.1
Queens.....	100.0	34.6	29.6	39.6	9.9	3.8	217.5	295.9
Richmond.....	100.0	15.3	10.9	26.7	4.0	1.4	158.3	221.5
Total.....	100.0	3.9	3.8	8.5	1.1	.4	117.7	115.2

in value has been 195.9 per cent but the special assessments, added to the taxes on vacant land and interest amount to 117.5 per cent. The average gross increase in value of all land in Queens has been nearly 7 per cent a year. If, however, the special assessments, taxes on vacant land, and the interest on these items are deducted from the gross increase the net increase in value is about 5 per cent a year. Because of the unusual increases in value in Queens, the figures for this borough were further analyzed by wards, as indicated by Tables XIII and XIV. The highest gross rate of increase in value was found to be in Newtown, which was made accessible during the fifteen-year period by the opening of the Corona subway, the opening of direct communication with New York through the tunnel to the Pennsylvania station, and the opening of Queensboro Bridge connecting with Queens Boulevard which runs through the center of this ward. The net rate of increase was, however, higher in Flushing, where there have been as yet very few special assessments. The highest net rate of increase was in Rockaway. This rapid increase is all the more striking in that it occurred almost entirely in the years from 1906 to 1911. Since 1912 the valuation in Rockaway has remained practically stationary. Rockaway is the smallest ward in Queens in area, and has also the smallest percentage of vacant parcels, thus making the carrying charges comparatively light.

Separate computations were also made for a tract of 15,556 acres or 24.3 square miles in Brooklyn. This area is about one-third of the total area of the borough, and lies to the south and southeast of Prospect Park, but does not include Coney Island or the shores or islands of Jamaica Bay. It is in this part of Brooklyn that development has been most rapid in the sixteen years covered by the computation. This large tract

TABLE XIII. — BOROUGH OF QUEENS. LAND VALUES, 1906-21

Ward	Land value in 1906	Taxes paid on vacant land	Special assessments	Interest on 1906 value ¹	Interest on taxes ¹	Interest on special assessments ¹	Total cost	Assessed value of land in 1921	Estimated land value in 1921
1 Long Island City.	\$34,416,000	\$9,877,200	\$12,806,000	\$14,175,000	\$2,736,500	\$2,483,600	\$76,494,300	\$72,492,100	\$80,546,800
2 Newtown	24,896,300	9,921,400	13,562,600	10,750,000	2,735,200	1,283,900	77,359,400	77,359,100	\$5,954,800
3 Flushing	17,616,500	6,394,100	1,042,100	6,480,000	1,920,500	97,300	33,550,500	49,412,400	54,902,700
4 Jamaica	28,011,200	11,452,300	6,789,700	11,720,000	3,348,800	480,800	61,802,300	78,823,000	87,581,000
5 Rockaway	11,160,700	2,584,900	1,115,900	2,897,000	702,400	8,600	17,469,500	31,088,000	34,542,000
Total	\$116,100,700	\$40,229,900	\$34,316,300	\$46,022,000	\$11,443,400	\$4,353,700	\$252,466,000	\$309,174,600	\$343,527,300

¹ Interest at 4% compounded annually, computed only in proportion to value of land remaining unimproved at the end of each year.TABLE XIV. — BOROUGH OF QUEENS. LAND VALUES, 1906-21
Costs as percentages of values in 1921

Ward	Land value in 1906	Taxes	Special assessments	Interest on value	Interest on taxes	Interest on assessments	Total carrying charge	Land value in 1921
1 Long Island City	42.7	12.3	15.9	17.6	3.4	3.1	95.0	100.0
2 Newtown	29.0	11.5	15.8	12.5	3.2	1.5	73.5	100.0
3 Flushing	32.1	11.6	1.9	11.8	3.5	.2	61.1	100.0
4 Jamaica	32.0	13.1	7.8	13.4	3.8	.5	70.6	100.0
5 Rockaway	32.3	7.5	.3	8.4	2.0	50.5	100.0
Total	33.8	11.7	10.0	13.4	3.3	1.3	73.5	100.0

Costs as percentages of value in 1906

Ward	Land value in 1906	Taxes	Special assessments	Interest on value	Interest on taxes	Interest on assessments	Total carrying charge	Land value in 1921
1 Long Island City	100.0	28.7	37.2	41.1	7.9	7.2	222.1	234.0
2 Newtown	100.0	39.9	54.5	43.2	11.0	5.2	253.8	345.3
3 Flushing	100.0	36.3	5.9	36.8	10.9	.6	190.5	311.7
4 Jamaica	100.0	40.9	24.2	41.8	11.9	1.7	220.5	312.7
5 Rockaway	100.0	23.2	1.0	26.0	6.3	.1	156.6	309.5
Total	100.0	34.6	29.6	39.6	9.9	3.8	217.5	295.9

has more than doubled in value while the land value of the whole borough has increased only 44 per cent. The carrying charges on vacant land, however, have very nearly equaled the whole increase in value. This section was largely developed during these years and the special assessments were therefore high, and there was a larger proportion of vacant land than in the older sections of the borough.

TABLE XV. — BOROUGH OF BROOKLYN
Tax Sections 15, 16, 17, 18, 19, 20, 23, 24 — 1906-21

	Amount	Per cent of 1921 value	Per cent of 1906 value
Land values, 1906.....	\$94,090,000	45.9	100.0
Taxes paid on vacant land.....	22,923,000	11.2	24.4
Special assessments.....	27,777,000	13.5	29.5
Interest on 1906 value ¹	34,699,000	16.9	36.9
Interest on taxes ¹	6,029,000	2.9	6.4
Interest on special assessments ¹	5,519,000	2.7	5.9
Total cost.....	191,037,000	93.1	202.1
Assessed valuation in 1921.....	194,970,000	95.0	207.1
Land value, 1921.....	205,170,000	100.0	218.1

¹ Interest at 4% compounded annually, computed only in proportion to value of land remaining unimproved at the end of each year.

In the city as a whole land values have increased only 15.2 per cent over the value in 1906. Even allowing for a possible error of 5 per cent in the estimates of value for 1921, the increase in land value in Greater New York in sixteen years is not more than 20 per cent, or about 1 per cent a year. This rate of increase is far below the average rate of increase during the nineteenth century. The tax valuations of all real estate in four out of the five counties now included in New York City, were in 1800: New York (Manhattan), \$18,696,270; Kings (Brooklyn), \$1,864,292; Queens, \$3,721,923, and Richmond, \$587,928. This would indicate a land value in Manhattan of from \$20,000,000 to \$30,000,000. In 1850 the assessed valuation in New

York County was \$207,000,000, indicating a land value of about \$250,000,000. In 1900 the valuation was \$2,370,000,000, indicating a land value of between two and two and a half billion dollars. These increases are equivalent to an average annual increase in land values of about 5 per cent a year. In Brooklyn, the average rate of increase from 1800 to 1900 was more than 6 per cent, while in Queens and Richmond the increases averaged about $4\frac{1}{2}$ per cent a year.

After this century and more of rapidly increasing land values, a sixteen-year period of practically stationary values, with but slight fluctuation from year to year, would appear to indicate some fundamental change in economic conditions. The explanation may perhaps be found in the greatly increased demands of the city in the form of taxes and special assessments. Special assessments are usually levied to pay for necessary permanent improvements which add directly to the use value of the land, but these improvements are now so expensive that they do not always add the amount of their cost to the speculative value of the land. Taxes as we have previously noted are relatively almost six times as heavy as in 1860, having risen from 0.50 per cent prior to that year to 2.77 per cent in 1921. Even as recently as 1906 the rate was only 1.12 per cent of the full value. If this additional tax is taken out of the economic rent of the land it is reasonable to assume that the new value of the land will be the capitalized value of the economic rent which still remains to the owner. Assuming an interest rate of 5 per cent, the capitalized value of the \$38,500,000 yield of Manhattan land taxes in 1906 would be \$770,000,000. Adding this to the estimated land value in that year (\$3,400,000,000) we have \$4,170,000,000 as the land value in Manhattan in 1906 if no land taxes had been imposed. Similarly, in

1921, the yield of the land tax was \$91,400,000. This sum capitalized at 5 per cent is \$1,828,000,000. Adding this to \$3,468,000,000, the estimated value of the land in 1921, we have \$5,296,000,000 as the untaxed land value in 1921. In other words if no land taxes had been imposed land values in Manhattan, instead of remaining stationary, would have increased \$1,126,000,000 or 25 per cent in sixteen years. For all boroughs the untaxed value increases would have been from \$5,500,000,000 to \$7,900,000,000 or 44 per cent. There are probably other factors which have also operated to lower the rate of increase in New York land values. The rate of population increase which was 40 per cent in the decade 1890-1900 was only 18 per cent in the decade 1910-20. With the improvements in transportation facilities the area available for development has vastly increased so that there is no longer the same necessity for concentration in population and economic activity as in the nineteenth century. On the other hand, the great increases in gross rentals may within a comparatively short time bring about a general increase in land values.

In all the foregoing discussions the matter of the changing general price level has been intentionally ignored. In the original computations, however, an attempt was made to reduce all the figures to the price level of 1913 in accordance with the United States Department of Labor index number of wholesale prices. In the computations covering a long period of years taking the carrying charges of each year at the 1913 price level and reducing the value in 1921 in the same manner, the total carrying charges were greatly increased and the 1921 value decreased, thus making the losses of the individual property owners far greater than in the unweighted computation. In the shorter

computations, however, the total carrying charge figures were usually slightly decreased on account of the larger proportion of annual charges paid during the period of higher prices.

CONCLUSIONS

1. A large part, and in some cases, all of the increase in the value of vacant land is offset by actual payments to the city in the form of taxes and special assessments with interest thereon.
2. These charges have increased rapidly within recent years, and at the same time the rate of increase in land values has fallen.
3. The holding of vacant land is not a profitable form of investment, except for short periods of time in exceptionally favorable locations.
4. Purchasers of outlying vacant lots at public auction almost invariably pay prices which discount future increases in value for many years to come, and leave to the purchaser a practical certainty of heavy loss.
5. While vacant land makes a substantial contribution to the revenue of the city there are certain elements of social loss in the premature subdivision of land.
 - (a) Through the aggregate losses of individual small purchasers.
 - (b) Through the loss of interest on the value of street improvements prematurely made and the loss due to their deterioration as a result of disuse and neglect.
 - (c) Through the premature withdrawal of land from agricultural use. This loss is, however, relatively slight, and is to some extent counter-

balanced by the frequent use of vacant lots for gardening purposes.

6. If land in favorable locations is so well improved that all carrying charges, including interest and full amortization of buildings, are paid out of rents, any increment of land value added by social growth is a net profit to the owner. The extent to which urban property yields such a profit is a question about which there is much difference of opinion. Since this study was concerned primarily with vacant land, a separate investigation would be necessary to determine the relationship between the increment of land value and the surplus of income, if any, over carrying charges, including amortization.

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